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I hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on October 17, 2002.

Melissa Garton
Melissa Garton

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Winfried PLUNDRICH et al.

Serial No.: 09/890,235

Filing Date: July 30, 2001

For: COMPOSITE OF TWO PARTS,
FORMED USING A GLUE

Examiner: Charles Pierson

Group Art Unit: Not yet assigned

RECEIVED

OCT 18 2002

OFFICE OF PETITIONS

**REVIEWED PETITION TO WITHDRAW THE HOLDING OF ABANDONMENT
AND PETITION TO REVIVE IN THE ALTERNATIVE**

BOX DAC

Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicants request withdrawal of abandonment for the above-referenced application.

Nature of abandonment:

- ☒ The undersigned has noted that the above-referenced application is being forwarded to the Abandoned Files because Applicants failed to respond to the Notification of Defective Response mailed 09/05/01 within the statutory period nor was any extension requested thereof.

According to the Official Action dated June 10, 2002, this application became abandoned because "no reply was received" in response to the Notification of Missing Requirements dated September 5, 2001. Applicants have previously provided a copy of the Notice of Abandonment.

A review of the file demonstrated that a Response to Notification of Missing Requirements was indeed filed on May 8, 2002, and a Petition to Withdraw the Holding of Abandonment was filed on July 9, 2002. Applicants received a Decision on Petition to

Withdraw Holding of Abandonment on September 10, 2002, which dismissed the Petition and held the application in abandonment. Subsequent to the receipt of the Decision, Applicants representative contacted Examiner Charles Pierson to discuss same. Examiner Pierson suggested that Applicants file this Renewed Petition, with explanation.

According to the Notification of Defective Response mailed April 9, 2002, a translation of the application into English was defective because “the number of claims in the International Application and the number of claims in the translation are not the same.” The Notification indicated that a new translation must be furnished in compliance with 35 USC 371. 35 USC 371(c)(2) states, in part, that “The applicant shall file...a copy of the international application...and a translation into the English language of the international application, if it was filed in another language.” (35 USC 371 does not state a copy of the *original* application.) Applicants responded to the Notification by filing an English translation of the IPER, explaining that various claims were canceled during the PCT phase of prosecution and that the English translation of the application was therefore a complete copy of the application.

In response to the Petition, Applicants received a Notice of Abandonment Under 37 CFR 1.53(f) or (g). The Notice indicated that the application was abandoned because “no reply was received” in response to the Notification of Defective Response. However, there was no mention in either the Notice of Abandonment or in the Notification of Missing Requirements that the application was abandoned because of a failure to provide an *original* copy of the English translation of the application. Hence, Applicants filed a Petition to Withdraw the Holding of Abandonment emphasizing that since Applicants had indeed responded to the Notification of Defective Response the holding of Abandonment should be withdrawn. The Petition filed July 9, 2002, as noted in the discussion of the Decision on Petition, explained that a translation of the IPER was filed which indicated cancellation of various claims in the PCT application, and explained that the English translation of the application originally submitted with the national stage papers was not defective.

It was not until Applicants received the Decision on Petition that the U.S. Patent and Trademark Office first identified 37 CFR 1.495(c)(1) as a reason for not having adequately

responded to the Notification of Defective Translation. 37 CFR 1.495(c)(1) “requires a translation of the international application, as filed, in to the English language, if it was originally filed in another language.” 37 CFR 1.495(c)(1) is inconsistent with 35 USC 371(c)(2) which requires “a translation into the English language of the international application” (without requiring a copy “as filed”).

Applicants, having only previously been notified that the application was not acceptable under 35 USC 371(c)(2), without mention of 37 CFR 1.495(c)(1), responded by supplying a translation of the IPER explaining the amendments made during the PCT phase of prosecution - Applicants understanding for receipt of the Notification of Defective Translation.

In light of the above explanation, Applicants hereby request that the Holding of Abandonment be withdrawn, and that the application be properly reinstated. In this regard, Applicants have attached a copy of the English translation, as filed, as required under 37 CFR 1.495(c)(1), along with a copy of the amended claims.

PETITION TO REVIVE IN THE ALTERNATIVE

In the event the Renewed Petition to Withdraw the Holding of Abandonment is denied, Applicants petition for revival of this application for unintentionally delaying the complete submission of the Response to Missing Requirements of Application. The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 C.F.R. § 1.137(b) was unintentional.

As all formalities have now been filed, Applicants hereby request revival of this application and that a copy of the Notice of Acceptance be sent to the undersigned.

Should any further information be required to fully consider this petition, a call to the undersigned at the telephone number listed is cordially invited.

The Commissioner is hereby authorized to charge any fees under 37 CFR §§ 1.16 and 1.17 that may be required by this petition, or to credit any overpayment, to **Deposit Account No. 03-1952** referencing Attorney Docket No. 449122007600.

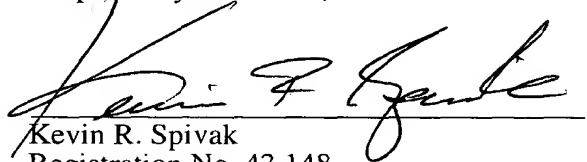
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these

statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Respectfully submitted,

Dated: October 17, 2002

By:

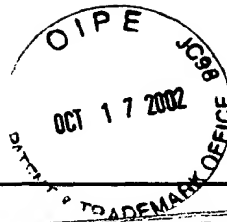

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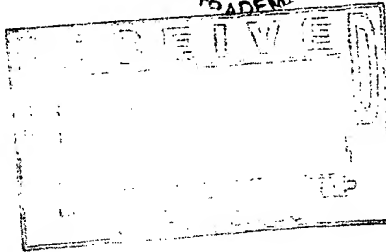
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DOCKETED *KSJ/VCF*
Resp Due 11-03-02
Last Day 04-03-03

In re Application of
PLUNDRICH, Winfried *et al*
Application No.: 09/890,235 ✓
PCT No.: PCT/DE00/00170
Int. Filing Date: 20 January 2000
Priority Date: 28 January 1999
Attorney's Docket No.: 449122007600
For: COMPOSITE OF TWO PARTS
FORMED USING A GLUE

**DECISION ON
PETITION TO WITHDRAW
HOLDING OF ABANDONMENT**

RECEIVED

The decision is in response to applicants' "PETITION TO WITHDRAW
HOLDING OF ABANDONMENT" filed on 09 July 2002. No fee is required.

OCT 18 2002
OFFICE OF PETITIONS

BACKGROUND

On 30 July 2001, applicants filed a transmittal letter for entry into the national stage in the United States under 35 U.S.C. 371 which was accompanied by, *inter alia*, a purported English translation of the international application.

On 05 September 2001, the United States Designated/Elected Office (DO/EO/US) mailed a NOTIFICATION OF MISSING REQUIREMENTS UNDER 35 U.S.C. 371 (PCT/DO/EO/905) and a NOTICE OF DEFECTIVE TRANSLATION (PCT/DO/EO/913) indicating that the translation was defective because the number of claims in the international application and the translation were not the same and that the Office required a translation of the original claims as filed.

On 07 January 2002, applicants filed a response which included an English translation of the International Preliminary Examination Report ("IPER") together with a two-month extension request with an accompanying \$400.00 check and authorization to charge any additional fees as required to Deposit Account No. 03-1952.

On 09 April 2002, the DO/EO/US mailed a NOTIFICATION OF DEFECTIVE RESPONSE (Form PCT/DO/EO/916) indicating that the translation of the international application was defective because the number of claims in the international application and the number of claims in the translation was not the same. This Notification required a response within one-month from the date of mailing thereof or within the time remaining for response set forth in the Form PCT/DO/EO/905. No further extensions of time were available.

COPY

On 08 May 2002, applicants submitted a document titled "COMMUNICATION" along with copies of the documents previously filed 07 January 2002.

On 10 June 2002, the DO/EO/US mailed a NOTIFICATION OF ABANDONMENT (Form PCT/DO/EO/909) indicating that the above-captioned application was abandoned for failure to reply to the Form PCT/DO/EO/905 mailed 05 September 2001 within the time period set therein.

On 09 July 2002, applicants filed the instant petition requesting that the holding of abandonment be withdrawn.

DISCUSSION

Applicants claim that the response filed 07 January 2002 contained a translation of the IPER which explains the canceling of claims in the PCT application. Therefore, the English translation originally submitted with the national stage papers on 30 July 2001 was not defective.

However, 35 U.S.C. 371 (c)(2) requires the applicant to file a copy of the international application, and a translation into the English language of the international application, if it was filed in another language. In addition, 37 CFR 1.495(c)(1) requires a translation of the international application, as filed, into the English language, if it was originally filed in another language. Moreover, 37 CFR 1.495(h) states that if "any required translation of the international application as filed and/or the oath or declaration are not timely filed, an international application will become abandoned as to the United States upon expiration of the time period set pursuant to paragraph (c) of this section."

Accordingly, the translation submitted on 30 July 2001 was defective because it was not a translation of the international application as originally filed. The translation did not include the same number of claims as the original. A translation of the international application as originally filed has not yet been submitted.

CONCLUSION

For the reasons above, the petition under 37 CFR 1.181 requesting that the holding of abandonment be withdrawn is **DISMISSED**.


The application remains **ABANDONED**.


Applicants may wish to consider filing a petition under 37 CFR 1.137(a) or (b) requesting that the application be revived. An acceptable English language translation of the international application as filed and a petition fee is required to be filed with the

petition to revive.

Any such petition to revive or request for reconsideration on the merits of this petition must be filed within **TWO (2) MONTHS** from the mail date of this decision. Any reconsideration request should include a cover letter entitled "Renewed Petition Under 37 CFR 1.181." No petition fee is required. Extensions of time may be obtained under 37 CFR 1.136(a).

Any further correspondence with respect to this matter should be addressed to the Assistant Commissioner for Patents, Box PCT, Washington, D.C. 20231, with the contents of the letter marked to the attention of the PCT Legal Office.


Richard Cole
PCT Legal Examiner
PCT Legal Office


James Thomson
Attorney Advisor
PCT Legal Office

Tel.: (703) 308-6457

REPLACED BY
ART 34 AMDTComposite of two parts, formed using a glue

5 The invention relates to the field of machine
elements and is to be used for designing a composite of
two parts, of which one is a rare-earth permanent
magnet and the other is a metallic support.

10 In a known composite of this type (DE 195 38
468 A1), a first part in the form of a cuboid permanent
magnet is screwed onto a second part in the form of a
cylindrical axle of a magnetic clutch. An epoxy resin-
based glue which has a dual curing mechanism is used
for this. - The invention is based on the discovery
that such a glue is not, however, suitable for the
15 permanent bonding of certain large-surfaced parts, such
as e.g. a rare-earth permanent magnet and an iron pole
of an electrical machine, because the thermomechanical
property level of the epoxy resin glue is not matched
in such a way, to the opposed thermal expansion
20 coefficients of the elements to be used, that the
elasticity of the bond produced in this way could meet
the extreme requirements which exist whenever two glued
parts with an opposed thermal expansion coefficient are
used in a temperature range of from -30°C to 150°C. Such
25 conditions are encountered, for example, in permanent-
field synchronous motors for the propulsion systems of
ships (Jahrbuch der schiffbautechnischen Gesellschaft
[Shipbuilders' yearbook] 81 (1987), pp. 221 to 227).
Depending on the size of the glued permanent magnets,
30 and therefore on the size of the joint surface,
thermally induced length-change differences between the
glued parts of up to a few hundred μm can occur; the
elasticity of the glued point or bond should permit
such length-change differences.

35 It is therefore an object of the invention to
design a composite, having the features of the preamble
of patent claim 1, in such a way as to provide a

composite which is stable over a wide temperature range even for parts with an opposed expansion coefficient and a large joint surface.

This object is achieved according to the invention in that, in the case of a joint surface of the rare-earth permanent magnet of at least 1000 mm² and a ferromagnetic pole of an electrical machine as metallic support, the glue consists of an addition-crosslinking, single-component and self-adhesive silicone glue, the glue layer having a layer thickness of from 70 to 150 µm and containing spherical spacers in an amount of from 0.5 to 5% by weight of the glue mass.

Such a joint is distinguished by a highly elastic bond that is stable over a wide temperature range, with very good adhesion on the two parts. To adjust the spaced joint, spacers in the form of glass and/or ceramic spheres have proved advantageous. The glass and/or ceramic spheres are either incorporated into the silicone glue before it is applied to one of the parts, or is scattered over the pre-applied silicone glue bed while the joint is still open. Spacers having a thickness of between 100 and 125 µm are preferably used. The proportion in the silicone adhesive is preferably from 0.75 to 3, in particular approximately 1% by weight, expressed in terms of the total silicone glue mass.

When producing the composite, it is sufficient if the silicone glue is applied to only one of the parts to be bonded. Which of the two parts to which it is applied is not important. The silicone glue is in this case e.g. spread or applied using a dispenser technique to the parts.

A fumed silica, e.g. Aerosil, may be incorporated into the glue intended for the novel composite in an amount of from 0.1 to 20% by weight, preferably from 0.5 to 10% by weight or, particularly preferably, from 2 to 5% by weight, the % by weight

referring to the total silicone glue mass. This positively influences the wetting performance of the silicone glue.

Addition-crosslinking, single-component and
5 self-adhesive silicone glues are known per se. A silicone glue sold by the manufacturing company Dow-Corning under the reference "Q 3-6611" is preferably used for the novel composite. This glue is distinguished by a very high tensile strength, high
10 expansion and high tear resistance in the temperature range mentioned in the introduction.

With the design according to the invention, glued composites of an iron pole and a magnetic material, e.g. a rare-earth permanent magnet material
15 produced by powder metallurgy ("VACODYM"), with a glued surface of more than 1000 mm^2 can be mastered. The difficulty when producing such composites is that the large-surfaced bonding partners have very different thermal expansion coefficients:

20 "Vacodym" $-1 \times 10^{-6}/\text{K}$ in the joint plane
iron $14.5 \times 10^{-6}/\text{K}$ in the joint plane.

This means that the silicone glue must compensate, in the working temperature range, for length changes which - expressed in terms of the dimensions of the magnetic
25 pieces - may be a few $100 \text{ }\mu\text{m}$. If the elasticity is insufficient, stresses occur in the glue bond so as to cause strength losses and premature failure of the bond. This has been confirmed by shear-strength studies on bonds, especially after exposure to heating cycles.

30 The production of a composite design according to the invention will be explained in more detail below.

An adhesive bed of the addition-crosslinking, single-component, self-adhesive silicone glue Q 3-6611
35 is first produced on one of the two parts. To that end, the silicone glue is spread over the parts with a layer thickness of $100\text{-}125 \text{ }\mu\text{m}$. Since the silicone glue is a self-adhesive silicone glue, i.e. one provided with an

internal adhesive, preliminary priming of the joint surface is not necessary. After the usual degreasing of the substrate surface, e.g. using a solvent, the silicone glue can be spread directly over the part. The wetting performance can be improved further, if required, by adding fumed silica. Glass spheres having a diameter of 100 - 125 μm are then scattered over the prepared silicone glue bed in an amount of approximately 1% by weight, expressed in terms of the total silicone glue mass. The second part is then joined onto this layer, a spaced joint with a size equal to the diameter of the glass spheres being created. The final strength of the composite is reached by curing the silicone adhesive for 2 hours at approximately 150°C.

A composite produced in this way was subjected to a shear-strength study. The shear strength in the initial state, and even after storage for 5 days at 150°C, was more than 5.7 N/mm² irrespective of whether it was measured at room temperature or at 150°C.

The addition-crosslinking silicone glue does not release any byproduct when it crosslinks. The composite produced thereby meets the adhesion requirement $> 1 \text{ N/mm}^2$ at 150°C and fulfils the requirement, with respect to thermal stability, placed on a permanent-field motor for the propulsion systems of ships which have such a composite.

In the crosslinked state, the composite is virtually free of mechanical stresses and provides the requisite strength over the entire temperature range of from -30°C to 150°C, because the silicone glue crosslinks to form an elastomer with high expansion (250%) and high tear resistance.

CLAIMS

1. The use of an addition cross-linking silicone adhesive for the thermally stable gluing of large-surface workpieces having opposing thermal expansion coefficients.

2. A method for the thermally stable gluing of large-surface workpieces having opposing thermal expansion coefficients, comprising the following steps:

- applying an addition cross-linking silicone adhesive to one of the workpieces;
- joining the two workpieces so that they attain the desired spacing; and
- hardening of the adhesive connection.

3. The method according to Claim 2, wherein the silicone adhesive contains one component, and/or is self-adhesive.

4. The method according to Claim 2 or 3, wherein pyrogenic silicic acid is added to the silicone adhesive.

5. The method according to one of Claims 2 through 4, wherein the silicone adhesive is applied in a layer thickness of 70 - 150 μm .

6. The method according to one of Claims 2 through 5, wherein electrical machines are used in the assembly process.

7. A composite of two solid workpieces having opposing thermal expansion coefficients, the workpieces having an elastic, stable connection in a temperature range between -30°C and 150°C through an addition cross-linking silicone adhesive.

8. A composite of two solid workpieces, wherein the one workpiece is a rare-earth permanent magnet and the other workpiece comprises a ferromagnetic material.

Composite of two parts, formed using a glue

ABSTRACT

The invention relates to a method for gluing together large-surfaced parts with opposed expansion coefficients in a stable manner, and to a composite structure produced in this way, e.g. for gluing a permanent magnetic element to a ferromagnetic material for an iron pole in an electric machine. The resulting composite structure is temperature resistant and low-stress and can resist high shearing forces of up to $5,7 \text{ N/mm}^2$ even at high temperatures. The invention is designed for use in permanent magnet synchronous motors in the propulsion systems of ships.

Patent claims:

1. A composite of two parts, of which one is a rare-earth permanent magnet and the other is a metallic support,
the composite being formed using a thermally curable glue that forms a spaced joint,
characterized in that
the rare-earth permanent magnet has a joint surface of at least 1000 mm² and the metallic support is a ferromagnetic pole of an electrical machine
and in that the glue consists of an addition-crosslinking, single-component and self-adhesive silicone glue,
the glue layer having a layer thickness of from 70 to 150 μ m and containing spherical spacers in an amount of from 0.5 to 5% by weight of the glue mass.
2. The composite as claimed in claim 1, characterized in that the diameter of the spacers, and therefore the thickness of the glue layer, is between 100 and 125 μ m.